

QA REVIEW MEMORANDUM

CONTRACT TITLE	Clarus Weather System Design	
CONTRACT ID	FHWA Contract No. DTFH61-05-C-00022; MHI Proj. No. 04037	
TASK TITLE	Develop Detailed System Requirements	
TASK ID	RQ301	
DOCUMENT ID	04037-rq301srs0200	STATUS: Final

ABSTRACT:

The purpose of this requirements specification is to provide a repository for the detailed requirements governing the design of the *Clarus* system. These requirements carry forward the high-level requirements with further refinement and allocation to specific components within the system. These detailed requirements form the basis for the design verification and validation of the system. The intended audience for this document includes decision makers, stakeholders, designers, and testers.

DISPOSITION MATRIX

Item	Review	Page	Section	Requirement	Section/ Paragraph/ Requirement	Comment	Response	Modified Y/N
1.	Seeling, L.				General	“Regional” needs multiple crisp definitions (geographical regions, political regions, etc.).	“Regional” has multiple applications within the document (and the larger <i>Clarus</i> context), but it is not necessary to define the term outside a specific use in a requirement.	N
2.	Seeling, L.				General	Would like to recommend end-to-end End User Performance goals, recognizing that these are outside the control of <i>CLARUS</i> , but are highly critical to user acceptance and could provide valuable insight from the Initial Proof of Concept test to aid in future design refinements.	End-to-end performance goals, which as noted are outside the span of the <i>Clarus</i> system’s control, can nonetheless be included in the Proof-of-Concept Test Plan and Demonstration Report. Performance requirements within the span of the system’s control will be retained.	N
3.	PBS&J				From PBS&J Business Models research	Reporting when a threshold has been met (instead of waiting for a regular polling cycle, if the sensor has a reading of meaning (high winds or just reached freezing for example) it would send an alert instead of waiting for its turn.	The concept has been discussed with the Task Force, but was not included in the requirements at this time.	N
4.	PBS&J				From PBS&J Business Models research	Getting the ESS station data at the same time reading. Some folks indicated that the value to models and such would go up if they had readings from all sites in a region at the same time as opposed to whenever they were polled.	This is not at the discretion of the <i>Clarus</i> system or program, since the ESS are managed independently by the contributors.	N

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5.	Mitretek - ArS				General	The SOW called for access latency requirements, hardware and software requirements, system functionality requirements (e.g., reliability, usability), and interface requirements testing requirements. Will these be included in the final Detailed System Requirements Specification after the ESS, COTS, AAA and GAP documents are complete?	Latency requirements have been included, and have been the subject of much discussion. Hardware and software requirements have been included to the extent practicable for a proof-of-concept system. Reliability and usability requirements have been included to the extent practicable for a proof-of-concept system where the detailed requirements are to be objectively testable. Interface requirements are present for several components. Compliance to all detailed requirements will be tested in the proof-of-concept deployment; the testing “requirements” are not requirements on the system itself.	N
6.	Stern, A.	1	1.1	N/A	Section 1.1, para 1	For consistency with rest of text use a hyphen in the term “high-level”	Done.	Y
7.	Stern, A.	1	1.1	N/A	Section 1.1, para 3	“Analysis of Architectural Alternative” document correct name is “Architectural Alternatives Analysis”	Corrected.	Y
8.	Stern, A.	1	1.1	N/A	Figure 1	Use a larger font on the bottom boxes containing definitions	The figure has been moved to its own page to enhance its legibility.	Y
9.	Seeling, L.	1	1.1	N/A	Figure 1	Font is too small for such an important figure. Consider a 6-8 point font limit on all figures for textual components.	The figure has been moved to its own page to enhance its legibility.	Y
10.	Alfelor, R.	1	1.1	N/A	1.1	In Figure 1, need to highlight the DRS box, not the ConOps box. Also need short description of what the Figure is about and the different elements.	Done.	Y

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11.	Pisano, P.	1	1.2	N/A	1.2	Under the first of four primary motivations, work in the point that this not only helps State DOTs be more productive, but it also helps maximize their RWIS/ESS investments.	Done.	Y
12.	Handman, A.	1	1.2	N/A	Scope 1.2 1)	Add after (DOTs): “and other transportation provider agencies”	Added “and other transportation agencies”.	Y
13.	Handman, A.	1	1.2	N/A	Scope 1.2 1)	Add at end of sentence: “and surface transportation platforms”	Done.	Y
14.	Bonds, J.	2	1.2	N/A	Sec.1.2/ pg 2/ 5 th para.	Recommend adding a sentence that states that the detailed system requirements apply to the first component of the <i>Clarus</i> Initiative – the system.	The Detailed System Requirements are specifically for the <i>Clarus</i> system. The scope and content of the <i>Clarus</i> Initiative are outside the context of this document.	N
15.	Alfelor, R.	2	1.2	N/A	1.2	In the list of stakeholders, where does the ‘general public’ fall under	Not a primary stakeholder.	N
16.	Welsh, P.	2	1.2	N/A	Page 2	Initial list of stakeholders does not include the public? F-805J1 refers does NTCIP 1204 list hydro data? Also Research “and engineering” community?	Correct. The public is not considered to be a primary user of <i>Clarus</i> ; F-805 and its children were deprecated in Task Force discussions. NTCIP 1204 does include some hydrologic data. “And engineering” has been added.	Y
17.	Pisano, P.	3	1.2	N/A	1.2	In the parenthetical statement under the 4 th bullet of the list of stakeholders, add the following to the end of it “- e.g., State DOTs”.	Done.	Y
18.	Mitretek - LG	4	1.4	N/A	Page 4, Section 1.4, Ref. 8	Replace the 1998 reference with the 2005 reference (recommended standard, v2.23).	Done.	Y
19.	Mitretek - LG	4	1.4	N/A	Page 4, Section 1.4, Ref. 16	Replace “August 2005” with “October 2005” when the updated System Architectural Description was released.	Done.	Y

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20.	Bonds, J.	5	1.5	N/A	Sec. 1.5/ pg 5 / 4 th para.	On page 5 in the overview of the document it is stated that “ Section 3 – Specific Requirements ” but on page 17, the title of the section is “System Architecture”. Page 19 is Section 4 titled “System Requirements” Recommend changing to “Section 4 – System Requirements” on pg 5.	The description of subsequent sections is corrected in the document.	Y
21.	Mitretek - ArS	5	1.5	N/A	Page 5, Section 1.5, Overview	The description given for Section 3 “Specific Requirements” is actually a description of Section 4. Section 3 “System Architecture” is not described.	The description of subsequent sections is corrected in the document.	Y
22.	Seeling, L.	6	1.2	N/A	1.2, last paragraph of page 6 with bullets before section 1.3	no “post processing” of data provided seems at odd with QC of data with feedback to operators in the bullet above. Depending on how you define the requirements for QC, it would help to clarify somewhere exactly what post-processing will be done and what won’t.	“Post processing” implies that data are changed. That is not the case in the Clarus system. Quality checking applies flags to the data, but does not modify the data.	N
23.	Stern, A.	6	2.1	N/A	Section 2.1, para 2	Change “Clarus participants” to “Clarus participant”	The terms have been made consistent.	Y
24.	Stern, A.	6	2.1	N/A	Section 2.1, para 2, last sentence	Details surrounding data sharing agreements are not discussed in this document	Data sharing agreements are necessary for, but not part of the Clarus system. Thus, requirements for the data sharing agreements are included in the program requirements of Section 4.12.	N
25.	Stern, A.	6	2.1	N/A	Section 2.1, para 3, 2nd sentence	The term “qualify” is first used here and is not described. In fact, numerous terms come later such as quality-controlled, quality checked, etc. Consistency about what this means should be stressed. For example, the last para of 2.1 uses “quality control” and the first para of 2.2 uses “qualify”. “Quality rules” versus “quality checking services” in section 3	The terms have been made consistent in all places.	Y

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26.	Bonds, J.	6	2.1	N/A	Sec. 2.1/ pg 6/ 3 rd para.	The second paragraph says that two new modes of functionality are added but the third paragraph mentions a 3 rd functionality. Recommend amending the 2 nd para. To state 3 new modes of functionality.	The text in the second paragraph refers to modes derived from the network connections. The third mode, described in the third paragraph, derives directly from <i>Clarus</i> . No change is necessary.	N
27.	Alfelor, R.	6	2.1	N/A	2.1 (end of 2 nd paragraph)	Shouldn't the data sharing agreements be with the <i>Clarus</i> system administrator, not the program?	The system administrator manages the system operations. The agreement has to be arranged with the <i>Clarus</i> Program.	N
28.	Welsh, P.	6	2.1	N/A	Page 6	Data providers can restrict access...raw data from publicly funded data networks should be publicly accessible via <i>Clarus</i> ...providers will be free to charge for QC and summary and processed datasets.	It is not clear from the comment what specific changes are being suggested. The discussion of data access and provider functions is contained in the ConOps and does not necessitate any change to the text of this document..	N
29.	Stern, A.	7	2.1	N/A	Figure 2	The "field instrumentation" label should be expanded to include "remote sensing"	Done.	Y
30.	Stern, A.	7	2.1	N/A	Section 2.1, 5th para	Change "While the participants want to access" to "While the participants may want to access"	Done.	Y
31.	PBS&J	7	2.1	N/A	2.1, page 7, paragraph 1	Capitalize "Internet" for consistency.	Done.	Y
32.	Pol, J.	7	2.1	N/A	Section 2.1	In second sentence of paragraph directly below Figure 2, there should be a mention of the approach applied by MADIS and their application of netCDF.	Insert a new sentence: "MADIS, for example, uses NetCDF files as a standard data interchange format."	Y
33.	Pol, J.	7	2.1	N/A	Section 2.1	Last sentence of section. This is a good statement on the <i>Clarus</i> approach to archiving.	Thank you.	N

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34.	Stern, A.	8	2.2	N/A	Figure 3	There is a missing object: The ability to retrieve external observations (such as from NOAA) for using in QC/quality feedback as directed in requirement F-161, & F-281	Any external observations can be subsumed under the existing objects (e.g., “sensor”, “collector”, “observation data”, etc.). Nonetheless, it may clarify the intent to add another object for “External Observations.”	Y
35.	Stern, A.	8	2.2	N/A	Figure 3	Is the arrow correct going from quality flags to prepared weather data? Shouldn't prepared weather data utilize quality flags?	The arrow between the two should be read as “Quality Flags” “Classify” “Prepared Weather Data”. The direction of the arrow specifies the subject/object relationship in the context of the relating action.	N
36.	Stern, A.	8	2.2	N/A	Figure 3	It implies that the <i>Clarus</i> system never creates a “product”. Is a QC'd listing of observations a product? Is a listing of visibility information derived from CCTV images a product?	The <i>Clarus</i> system “product” in Figure 3 is “Prepared Weather Data.”	N
37.	Stern, A.	8	2.2	N/A	Section 2.2, just below Figure 3	Should the term “and qualify” be added after “gather, organize, ...”?	The words “quality check are inserted after organize.	Y
38.	Bonds, J.	8	2.2	N/A	Sec. 2.2/ Figure 3 / pg. 8	The white ellipse labeled <i>Clarus</i> Program – is that the <i>Clarus</i> Initiative? It is outside the <i>Clarus</i> System.	No. It is the program that administers the system over its operational life, and is itself another part of the <i>Clarus</i> Initiative.	N
39.	Seeling, L.	8	2.2	N/A	Figure 3	Font is too small for such an important figure. Consider a 6-8 point font limit on all figures for textual components.	The figure is placed on its own page to be more legible.	Y
40.	Alfelor, R.	8	2.2	N/A	2.2, Fig. 3	Why is ‘ <i>Clarus</i> Program’ not a system object (highlighted)?	The “program” administers the “system”, but is not itself part of the system.	N

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41.	Alfelor, R.	9	2.2	N/A	2.2, Table 1	<p>Under Features, change 'Fixed ESS Data' to 'Metadata', and Mobile ESS Data to 'Mobile Sensor Data'.</p> <p>Under Data Types, what is the difference between type of station and station category?</p> <p>Why limit to 'Pavement Treatment Information', is the data limited only to highways and bridges, what about other modes?</p> <p>Need to clarify the different data types (i.e. Sensor data, camera imagery)</p>	The table is generally being revised to match the 2005 version of NTCIP 1204 (see comment below), which will resolve or obviate these issues.	Y
42.	Mitretek - LG	9	2.2	N/A	Page 9, Table 1	<p>Table 1 was based upon the 1998 version of NTCIP 1204. The 2005 version (recommended standard v02.23b, 7/05) contains additional data types (e.g., Precipitation Start Time, Pavement Sensor Location, Mobile Platform Detected Friction, and Stationary Pavement Treatment Status). Update this table based upon information in Annex A on page 117 of the recommended standard, www.ntcip.org/library/documents/pdf/1204v02-23b.pdf.</p>	Done.	Y
43.	Welsh, P.	9	2.2	N/A	Page 9	<p>Hydrologic data such as river or stream stage and flow rate and flood stage/classification is not listed in table 1. Referenced later but table 1 does not list hydro data.. Also is SHEF-encoded Hydro and meteorological data considered? List SHEF in Appendix A.</p>	<p>Table 1 is based on NTCIP 1204 data definitions; some hydrologic parameters are included.</p> <p>Per Task Force discussions, SHEF will not be included at the time.</p>	N

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44.	Stern, A.	10	2.2	N/A	Figure 4	Replace this old figure with the one in the final version of the ConOps. There are term consistency problems with the old figure.	Done.	N
45.	Pol, J.	10	2.2	N/A	Section 2.2	1st 2 sentences below Figure 4. This appears similar to the two latencies experienced in MADIS.	Noted.	N
46.	Welsh, P.	10	2.2	N/A	Page 10	Figure 4 was blank in my copy of the document	The figure is present in the master and other copies; there may be a problem with the software or hardware used to read or print the document.	N
47.	Welsh, P.	10	2.2	N/A	Page 10	Refers to data age, generally accepted terminology is data latency.	Either term is acceptable; no change is required.	N
48.	Task Force	10	2.2	N/A		Replace “to perform the required human- and machine-based” with “to perform the human- and machine-based”.	Done.	Y
49.	Welsh, P.	11	2.3	N/A	Page 11	Research and engineering community.	“and engineering” is inserted.	Y
50.	Welsh, P.	12	2.3	N/A	Page 12	Service Providers Layer public private and research and engineering communities.	Noted.	N
51.	Alfelor, R.	13	2.3	N/A	2.3, Figure 6	‘Transit’ should be labeled ‘Transit Agencies’, ‘Rail’ should be labeled ‘Freight Rail Agencies’ because high-speed/commuter rail agencies fall under ‘Transit’. ‘Vehicle’ should be renamed ‘Vehicle Collectors or Sensors’. Aren’t some of these agencies also federal/state/local? The distinction among the 4 sources of <i>Clarus</i> data is not very clear.	The figure is taken directly from the ConOps and is retained as is, until the ConOps is likewise modified.	N

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52.	Seeling, L.	14	2.3	N/A	Page 14, second bullet	Recommend expanding the context of where road condition information comes from such as information meteorological/hydrological data from nearby river/lake systems that influence the surface transportation network conditions.	Figure 6 and its associated content are derived in whole from the ConOps. Observations of meteorological and hydrological conditions in this context would be provided by one of the means described in the bulleted list, or would otherwise not be available to Clarus. No change to the text is needed.	N
53.	Handman, A.	14	2.3	N/A	User Characteristics 2.3, Rail p.14	Add after frozen switches: “icing on electrical power distribution systems”	Done.	Y
54.	Welsh, P.	15	2.3	N/A	Page 15	Research should also mention road pavement and bridge engineering.	The “Research” bullet does not include any list of applications, so it would not be appropriate to list these specific items without also including others.	N
55.	Pol, J.	15	2.4	N/A	Section 2.4	2nd sentence of 2nd paragraph. Clearly there is a favor towards a distributed architecture. This may or may not necessarily be in alignment with the MADIS operation plan.	Noted. The discussion is still, however, relevant and accurate.	N
56.	Welsh, P.	15	2.4	N/A	Page 15, Sect. 2.4	General constraints excellent but even in a non-critical system should at least mention identification and minimization of single points of failure. Deal with duplicate data?	Managing single points of failure is one aspect of assuring system reliability. System hardware and software will both be designed to eliminate or reduce the consequences of points of failure.	N
57.	Bonds, J.	15	2.5	N/A	Sec. 2.5/ last para./ pg. 15	The word “shall” is used in the over view section. Recommend changing it to “will” or some other adverb since section 3 is where the “shalls” reside.	Okay; done.	Y
58.	Stern, A.	16	2.5	N/A	Section 2.5, para 3	“data sharing agreements” are still not described	The data sharing agreements are outside the scope of the system itself, although it is difficult to discuss system behaviors without reference to their impact.	N

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59.	Stern, A.	16	2.5	N/A	Section 2.5, para 7, last sentence	Figure 9 of the ConOps (page 32) specifically shows database tools as a data service. Is it correct to absolutely indicate that no special database tools will be developed?	Figure 9 of the ConOps was interpreted in generating the requirements to refer specifically to tools operating directly on a database, in contrast to modules (like the Configuration and Administration User Interface) that might be handling data, but do not directly operate on a database. To the extent that this interpretation is correct, the statement is correct.	N
60.	Alfelor, R.	16	2.5	N/A	2.5, 4 th paragraph	Geographic coordinates will not mean anything to the direct users, there has to be some location info (route name, MP, etc)	Route names and milepost locations are secondary data for meteorological purposes and can be applied in value-added products if needed.	N
61.	PBS&J	16	2.5	N/A	2.5, page 16, paragraph 4 & 5	Do geographic information systems or GIS need to be mentioned specifically?	No. GIS are generally applications independent of <i>Clarus</i> ; the discussion concerns the geo-reference data, not applications.	N
62.	Bonds, J.	17	3	N/A	Sec. 3/ pg 17	Recommend using a structure that is composed of a single system that is made up of subsystems that are made up of components that are made of units that are made up of elements for the purpose of requirements allocation and synthesis.	The items shown in Figure 7 are subsystems within the <i>Clarus</i> system. The “system” to “subsystem” to “component” to “element” hierarchy is somewhat arbitrary, and is not strictly adhered to in this document, but the relationship between parent and child components is identified in all cases.	N
63.	Alfelor, R.	17	3	N/A	Section 3, Figure 7	Need to depict subscription requests to schedule service for environmental data	Done.	Y
64.	PBS&J	17	3	N/A	3, page 17, paragraph 1 & 2	Format “Figure 7” for consistency	Done.	Y

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65.	Mitretek - LG	17	3	N/A	Pages 17, 22 & 42; acronym	In Figure 5 on page 17, “EM” is defined as “Environmental Metadata”. On pages 22 and 42, “EM” is “Environmental Metadata Cache”. Consider changing this acronym to “EMC” too avoid confusion.	Done.	Y
66.	Mitretek - LG	17	3	N/A	Pages 17, 22 & 49; acronym	In Figure 5 on page 17, “QED” is defined as “Qualified Environmental Data”. On pages 22 and 49, “QED” refers to the “Qualified Environmental Data Cache” module. Consider changing this acronym to “QEDC” too avoid confusion.	Done.	Y
67.	Mitretek - LG	17	3	N/A	Pages 17, 71 & 89, acronym	On page 17, “QC” is defined as “quality checking”. On pages 71 and 89, the acronym is defined as “Quality Control”.	The term and acronym and have been changed consistently throughout the document to “quality checking” and “QCh”.	Y
68.	PBS&J	18	3	N/A	3, page 18, paragraph 3	Spell out “&”; delete “s” to make “rule”	Done.	Y
69.	Mitretek - ArS	18	3	N/A	Page 18, Section 3	The third paragraph “The set of collectors in the <i>Clarus</i> system receives ... acquiring observations from non-automated sources” is confusing. The paragraph seems to use the word “collector” to mean two different things. One reading of the paragraph is that “ED collectors” are external to <i>Clarus</i> but the “collector service” is internal to <i>Clarus</i> . The generic term “collector” in the first and last sentence appears to refer to collectors internal to <i>Clarus</i> . For clarity and consistency with Figure 7, consider using the phrase “collector service” when referring to <i>Clarus</i> components.	The first sentence is amended to read “The set of collector services...” The last sentence in the paragraph is removed as a consequence of the Task Force decision to eliminate the Manual Entry User Interface component.	Y

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70.	Pol, J.	19	4	N/A	Section 4.0	The narrative here needs to be more congruous with the Detailed Requirements, explaining what they are and the value they supply to developing a design.	The text has been expanded to provide this insight.	Y
71.	Pol, J.	19	4	N/A	Section 4.0	As a guide to the reader, there should be instruction to refer to Figure 7 to continue the interpretation of detailed requirements.	Done.	Y
72.	Pol, J.	19	4	N/A	Section 4.0	The narrative should also describe more clearly the numbering scheme that is applied, so that a 'cold' reader can interpret the numbering scheme more effectively.	Additional text describing the structure of the numbering scheme has been added to Section 4.	Y
73.	Mitretek - LG	19	4	N/A	Page 19, Section 4	On line 1, it is noted that this section "presents the high-level requirements for the Clarus System". However, P-021 and P-022 from the final HRS (released on 7/11/05) are not included.	The text has been clarified by removing the words "high-level". All requirements (high-level and detailed) are contained in this section.	Y
74.	Alfelor, R.	20	4	N/A	Section 4	Table 2 should be referred to before Table 3.	The text is clarified by inserting "as described in Table 2 and" before "as shown in Table 3".	Y
75.	PBS&J	20	4	N/A	4, page 20, 2nd bullet	Change "to" to "of" and "from" to "to"?	Not necessary.	N

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76.	Mitretek - LG	20	4	N/A	Page 20, Section 4	Will the “Requirements Matrix” noted in the paragraph following the bullets be provided as a separate traceability document, as part of the revised Configuration Management Plan, or as a part of the final Detailed System Requirements Specification? The SOW also requires that changes to system requirements be documented by version number. The following high-level system requirements were changed, deprecated or added since the final HRS was released on 7/11/05: D-062, F-135, F-140, F-141, F-162, F-166, F-207, F-216, F-217, F-218, F-219, F-221, F-401, F-801, H-011, H-020, H-021, H-022, H-023, H-120, H-121, H-122, H-123, H-201, I-012, I-014, I-023, I-032 and X-801.	The requirements matrix is published in the Detailed Systems Requirements Specification (this document). Version numbers are assigned to the document in which the requirements are published; specific changes to particular requirements are noted in the comments attached to a requirement and in the review comment disposition matrix, which becomes part of the configuration trail.	N
77.	Mitretek - LG	20	4	N/A	Pages 20 & 22	Reference Table 4 in the text. For example, on the last line of page 20, replace “modules” with “modules listed in Table 4”.	Done.	Y
78.	Alfelor, R.	21	4	N/A	Section 4, Table 3	Why is it ‘Design Constraints’ rather than Design Requirement?	“Design Constraints” are a type of requirement that constrains the design (rather than specifying a function or interface).	N

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79.	Bonds, J.	22	4	N/A	Sec. 4 /pg 22	The structure of defining “allocation modules” at the system level is making the future requirements traceability overly complex. It is recommended that the “allocation modules” be called “functional subsystems” and then let the contractor develop a detailed design by allocating the subsystem functional requirements to lower levels (components /units/ elements) thereby preserving the system structure and traceability	The “allocation” is to a functional subsystem as shown in Figure 7 of the document. The process suggested in the comment is exactly what has been done in this document.	Y
80.	Alfelor, R.	22	4	N/A	Section 4, Table 4	EM should be Environmental Metadata (take out the word ‘Cache’)	The name has been corrected throughout the document to “Environmental Metadata Cache”.	Y
81.	Mitretek - LG	22	4	N/A	Page 22, Table 4	Based upon the requirements in Section 4.8, the “Name of Allocation Module” for QED should be “Qualified Environmental Data Cache” rather than “Qualified Environmental Data”.	The name has been corrected throughout the document to “Qualified Environmental Data Cache”.	Y
82.	Bonds, J.	23	4	N/A	Sec. 4/ pg 23	A complete requirement ID would have the component name followed by the requirement ID. For example CAS-F-101 is the F-101 requirement in the Configuration and Administration Service and QEDSD-F-101 is the requirement for the Qualified Environmental Data Services – is this correct?	It is generally bad database practice to encode an independent piece of data into an identifier. The allocation has therefore been maintained in a separate column from the requirement ID.	N

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83.	Bonds, J.	23	4	N/A	Sec. 4 / pg 23	The structure of the high level requirements result in parent child relationships at the highest level of the system making the distinction between a user level requirement and a system requirement fuzzy. Recommend that Mixon-Hill define a set of "A level" requirements that represent user (or stakeholder) requirements and then specify a set of System functional requirements that satisfy those user level requirements that trace back to the A level. Alternatively....see comment #10.	The distinction between a "user requirement" and a "system requirement" is somewhat arbitrary. The parent-child relationships identified in this provide exactly the traceability asked for in the comment and do not need to be changed on that account.	N
84.	Bonds, J.	23	4	N/A	Sec. 4, pg. 23	The presentation of the requirements is confusing in the context of the system structure. It appears that the first requirement is a "system" requirement that is followed by a "subsystem requirement for that particular "allocation module". It would be easier to understand if all the system requirements were listed as <i>Clarus</i> System Requirements and had a prefix of the letter "S". The each "S-xxx" requirement would list the "allocated subsystem requirements. For example D-131 would become S131 and the allocated CAS subsystem requirement would be CAS001.	The suggestion is a valid alternative to the method used in this document, but would not be appropriate at this stage of the system development process. The structure used herein is an extension of that used in the high-level requirements definition, and it would not be productive to modify it.	N

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85.	Bonds, J.	23	4.1	D-131B1	D-131B1	<p>Recommend combining with D-131 to read: “The <i>Clarus</i> system shall have a minimum of one system administrator per <i>Clarus host</i>.”</p> <p>This comment applies to most of the remaining requirements and won’t be repeated because it is a reflection of the requirements structure commented on in comment number 10.</p>	The D-131 and D-131B1 requirements have been deprecated.	Y
86.	Stern, A.	23	4.1	F-101	Section 4.1, Req F-101	What is meant by “continuous quality control processes”? Is this the correct usage? What if QC is both scheduled and on demand – but not continuous? Is this a correct requirement?	The requirement was taken directly from the ConOps. The language of the requirement is clarified, however, by removing the word “continuous” and inserting “as soon as data become available” after “processes”.	Y
87.	Pol, J.	23	4.1	F-101B1	F-101B1	Does the CAS accept schedules for QCS config from the CAUI?	Not necessarily. As will be determined in the system design activities, QChS schedules may be part of the QChS themselves.	N
88.	Pol, J.	23	4.1	F-101B1	F-101B1	Does the SS need to ack? Are ack messages assumed throughout the modules (that are monitored by the DOG)? This is probably premature.	This functionality will be considered as part of the design activities.	N
89.	Mitretek - ArS	23	4.1	F-151B1	Page 23, F-151B1	This is the only requirement that refers to “quality checking methods”. Are these methods the “QC test methods” in Appendix B? If so, use consistent terminology. The requirement is to “record” but none of the other expected functions (such as inputting these methods or using them) are defined.	<p>“Quality control” has been replaced in all requirements with “quality checking.”</p> <p>The methods are configured, not input.</p>	N

Item	Review	Page	Section	Requirement	Section/ Paragraph/ Requirement	Comment	Response	Modified Y/N
90.	Alfelor, R.	23	4.1	N/A	4.1	<p>In the 'Allocation' column, why is CAS identified if the requirements for 4.1 are CAS requirements? What do the other allocations mean?</p> <p>Need to explain some of the requirements in the comment column (e.g. administrator security group)</p> <p>In many cases the requirements are redundant or subsets of other requirements.</p> <p>The table needs to be organized more systematically.</p>	<p>High level requirements can be allocated to more than one component, and appear in all subsections of the requirements table to which they are allocated. There are therefore some duplicates of the high level requirements. Although this may create some minor confusion, it simplifies the identification of all requirements applicable to a particular component.</p> <p>Comments have been added as described throughout this disposition matrix to clarify the intent of the requirements, and some definitions have been added to Appendix A.</p>	N
91.	Mitretek - ArS	24	4.1	F-155B2	Page 24, F-155B2	<p>These are the only requirements for "quality checking rules". Are these distinct from "quality control rules" called out in other requirements? Also there are no requirements to configure or define quality checking rules as there are for quality control rules. Be consistent.</p>	<p>"Quality control" has been replaced in all requirements with "quality checking."</p>	N
92.	Stern, A.	24	4.1	F-161	Section 4.1, Req F-161, comment	<p>Need to make sure that the <i>Clarus</i> System has access to other observations (such as NOAA Metars) for QC</p>	<p>The <i>Clarus</i> system will be able to get other (non-DOT ESS) observations for quality checking.</p>	N
93.	Pol, J.	24	4.1	F-163B1	F-163B1	<p>Additional requirement? The CAUI shall provide a range of lat/long geocodes.</p>	<p>Geocoding is not required because stations can be identified by their unique station names.</p>	N

Item	Review	Page	Section	Requirement	Section/ Paragraph/ Requirement	Comment	Response	Modified Y/N
94.	Mitretek - ArS	24	4.1	N/A	Pages 24 thru 27, Section 4.1, CAS; Pages 61 thru 67, Section 4.10, QCS	There are various requirements to implement, configure, and define quality control rules. However, there are no requirements to use these rules in carrying out quality checking. Also there are no associated requirements for such functions as managing, editing, storing, retrieving, disseminating, recording, or printing quality control rules.	“Quality control” is replaced with “quality checking” throughout Section 4.1.	Y
95.	Pol, J.	25	4.1	F-171B1	F-171B1	Additional requirement? Is there a CAS capability to record changes/updates in algorithm use?	Not for the system itself. There may be a need for the <i>Clarus</i> program to manage changes to the system.	N.
96.	Stern, A.	25	4.1	F-213	Section 4.1, Req F-213	Change “observed environmental data” to “observed or derived environmental data” to account for products such as visibility information from CCTV images.	“Observed” is deleted from the requirement.	Y
97.	Pol, J.	25	4.1	F-806B1	F-806B1	Need more definition on security group members? Geographic? Temporal?	A definition has been added to Appendix A.	Y
98.	Mitretek - LG	25	4.1	F-806B1	Page 25, Section 4.1, F-806B1	For consistency with other requirements in this section, replace “CAS system” with “CAS”.	Done.	Y
99.	Pol, J.	26	4.1	F-901B1	F-901B1	Need more subrequirements here for all types of system operation parameters	To be defined during design activities.	N
100.	Welsh, P.	26	4.1	F-901B1	F-901B1	Add... ‘parametric and non-parametric’ statistical distributions	Including both is the same as not including both. No change is necessary.	N
101.	Mitretek - LG	26	4.1	F-905	Pages 26, 36, 41, 45, 54, 66 & 68; F-905 allocation	Replace “CS, QEDS, EMS, QCS, CAS, SS” with “CS, QEDS, EMS, QCS, CAS, SS, DOG”.	Corrected in all occurrences.	Y
102.	Bonds, J.	26	4.1	F-905B1	F-905B1	Should the wording be changed to “data transactions” since “its activities” may be too general an interpretation of the requirement?	Done.	Y

Item	Review	Page	Section	Requirement	Section/ Paragraph/ Requirement	Comment	Response	Modified Y/N
103.	Stern, A.	26	4.1	H-120	Section 4.1, Req H-120	Do you need to add mobile metadata?	No; resolved by change in wording for all occurrences of H-120.	N
104.	Mitretek - LG	26	4.1	H-120	Pages 26, 29, 42 & 45; H- 120	Replace “sensor station environmental metadata” with “sensor station metadata” as the second instance of “environmental” is redundant. This change will also distinguish station metadata (e.g., sensor height, station latitude) from observation metadata (e.g., time stamp for visibility measurement).	Resolved.	Y
105.	Mitretek - ArS	26	4.1	N/A	Pages 26 thru 30	Different requirements refer to a “quality manager”, a “quality technician manager” and “qualified personnel”. Is the “quality technician manager” in F-806B3 on page 26 the same as the “quality manager” in F-111C1 on page 28? Is the “quality manager” a subset of “qualified personnel”? If yes, that would imply that only a manager would be allowed to apply manual flags as described in requirements F-111C1 through F-111C4. Is this is what is intended? If no, then that means a manager would not be allowed to carry the function described in F-141C2. Is this what is intended?	The term “quality manager” will be used consistently throughout.	Y
106.	Mitretek - ArS	27	4.1	H-120B1 H120B2 I-031C1 I-031C2	Page 27, H- 120B1 & H- 120B2; Page 30, I-031C1 & I-031C2	These requirements are vague. What is meant by “manage”? The high level requirement H-120 is more detailed and explicit than the detailed requirements.	The H-120 requirement has been changed throughout the document by deleting the words “that include...”	Y
107.	Task Force	27	4.1	H-120B5		Add a requirement: “The CAS shall manage ESS metadata.”	Done.	Y

Item	Review	Page	Section	Requirement	Section/ Paragraph/ Requirement	Comment	Response	Modified Y/N
108.	Mitretek - LG	28	4.2	F-111	Pages 28, 49, 61; F-111 allocation	Replace “QCS, CAUI” with “QCS, QED, CAUI”.	Done.	Y
109.	Mitretek - ArS	28	4.2	F-111	Page 28, F-111C1, F-111C2, F-111C3, F-111C4	Why does F-111C1 include the word “individual” whereas succeeding requirements do not? Is there a distinction between an individual set of observations and a set of observations?	Replace “an individual ESS set of observations” with “a set of observations from an individual ESS”.	Y
110.	Mitretek - LG	28	4.2	F-141	Pages 28 & 62, F-141	The wording of the requirement is inconsistent. On page 28 “assessment” is used. On page 62 “checks” is used.	“Assessment” is replaced with “checks”.	Y
111.	Stern, A.	28	4.2	F-141C1	Section 4.2, Req F-141C1	What is the specification for a person to be “qualified”?	To be identified by the <i>Clarus</i> program.	N
112.	Mitretek - ArS	28	4.2	F-141C1	Page 28, F-141C1	Consider changing “apply a manual quality flag” to “apply a manual quality flag to environmental data”.	Okay. In F-141, “observations is replaced with “environmental data”.	Y
113.	PBS&J	29	4.1	F-141C2	F-141C2, page 29	Delete “configure a rule that automatically”; change “applies” to “apply”	Requirement deleted per task force review.	Y
114.	PBS&J	29	4.1	F-141C3	F-141C3, page 29	Re-word “a manual quality flags”	Done.	Y
115.	Mitretek - LG	29	4.2	F-141C3 F-100D2 F-223D1	Page 29, F-141C3; Page 31, F-100D2 ; Page 33, F-223D1	These requirements contain minor grammatical errors.	Done; done; done.	Y
116.	Stern, A.	29	4.2	F-141C3	Section 4.2, Req F-141C3	Either remove “a” or make “flags” singular	Done.	Y
117.	Pol, J.	29	4.2	F-141C3	F-141C3	Correct to read: “The CAUI shall allow manual quality flags to be entered.”	Done.	Y
118.	Pol, J.	29	4.2	F-141C3	F-141C3	CAUI should prompt the quality manager when the time range defined in F-111C4 expires.	F-111C4 covers open-ended time ranges, which would never expire. There can therefore be no notification	N

Item	Review	Page	Section	Requirement	Section/ Paragraph/ Requirement	Comment	Response	Modified Y/N
119.	Task Force	29	42	F-155, F-155C1		Replace “for each parameter” with “specific to each parameter” in both requirements.	Done.	Y
120.	Stern, A.	29	4.2	H-120	Section 4.2, Req H-120	Add mobile metadata?	The text of the requirement is simplified (in light of the definition of environmental metadata in Appendix A) by deleting the text “that includes...”	Y
121.	Mitretek – ArS	29	4.2	H-120	Pages 29 & 30, H-120	This high level requirement establishes, among other things, the requirement to acquire metadata. Only detailed requirement H-120C2 amplifies on this. Is there any other way that environmental metadata can be acquired/enter into the system other than by manual entry by system administrators? For example, could a GIS map with ESS coordinates or pavement type information be ingested automatically? Could an ASCII text file with ESS sensor types be ingested automatically?	The text of the H-120 child requirements is modified to clarify the issue. H-20C1 now reads: “The CAUI shall enable administrators to acquire environmental metadata.” H-120C2 now reads “The CAUI shall enable administrators to manage environmental metadata.”	Y
122.	Mitretek - ArS	30	4.2	H-120C2	Page 30, H-120C2	This requirement refers to “system administrators”. Subsequent requirements refer to “administrators”. Is there a distinction between the two terms? Be consistent.	“System administrators” is changed in this requirement to “administrators.	Y
123.	Mitretek - ArS	30	4.2	I-031	Page 30, I-031	What is the complete list of system administration functions implied by this requirement?	To be determined in the design activities.	N
124.	Pol, J.	30	4.2	I-032C2	I-032C2	Automatic time parameters and open ended privileges needed here?	No.	N

Item	Review	Page	Section	Requirement	Section/ Paragraph/ Requirement	Comment	Response	Modified Y/N
125.	Mitretek - LG	30	4.2	I-032C2	Page 30, I-032C2	Does the requirement for the CAUI to “enable administrators to assign system privileges” refer to system access by administrative personnel or by end users? Please clarify.	Yes. Both.	N
126.	Bonds, J.	31	4.3	F-100D2	F-100D2	Typo – “the” is used twice.	Done.	Y
127.	Handman, A.	31	4.3	F-100D2	CS, F-100D2	A typo: Delete duplicate “the”	Done.	Y
128.	Mitretek - ArS	31	4.3	F-100D2 F-218D1	Page 31, F-100D2; Page 33, F-218D1	As written, the requirement to “transform” applies only to extracted environmental data. Will NWS “watches, warnings, and advisories” (F218-D1) be transformed for storage?	No. The F-218 requirements have been deprecated.	N
129.	Welsh, P.	31	4.3	F-100D2	F-100D2	The the and open database standard formats.	The <i>Clarus</i> system-internal data storage format will be determined during system design activities.	N
130.	Stern, A.	31	4.3	F-200	Section 4.3, Req F-200	The <i>Clarus</i> system should not only detect errors, but also properly handle (without crashing) via hardened exception handling	Low-level transmission errors will be handled by the operating system and its communications components. The <i>Clarus</i> system will only note in its log that such errors have occurred.	N

Item	Review	Page	Section	Requirement	Section/ Paragraph/ Requirement	Comment	Response	Modified Y/N
131.	Mitretek - ArS	31	4.3	N/A	Pages 31 thru 40, Section 4.3	The following verbs are used in various requirements in this section: accept access acquire collect extract receive retrieve Each of these terms should be carefully defined and distinguished from the others. If some of the terms are synonymous, then for consistency use only one of them throughout.	Generally accepted common English definitions are adequate for understanding these requirements.	N
132.	Stern, A.	32	4.3	F-211 F-211D1	Section 4.3, Req F-211 and F-211D1	Will the <i>Clarus</i> system need to contain a preprocessor so that road weather information can be extracted and/or translated to be properly stored in the database?	The processing of VII data to generate observations is outside the scope of the <i>Clarus</i> system. Pseudo-observations generated by an external preprocessor can be collected by <i>Clarus</i> .	N
133.	Stern, A.	32	4.3	F-211 F-211D1	Section 4.3, Req F-211 and F-211D1	Will the <i>Clarus</i> system need a preprocessor to take individual observations and create grids of fields or values per segment of roadway?	The <i>Clarus</i> system will accept observations (of any NTCIP 1204 type) with a location, timestamp, and source. If gridded data were provided, the system would store it as an observation at the referenced grid location.	N
134.	Pol, J.	32	4.3	F-211D1	F-211D1	CS likely will be the subscriber to the VII output provider	Agreed.	N
135.	Stern, A.	32	4.3	F-214	Section 4.3, Req F-214	Does <i>Clarus</i> need to support a separate process to collect and extract visibility information from CCTV images?	The processing of the images to generate observations is outside the scope of the <i>Clarus</i> system.	N

Item	Review	Page	Section	Requirement	Section/ Paragraph/ Requirement	Comment	Response	Modified Y/N
136.	Pol, J.	32	4.3	F-221D1	F-221D1	Should add additional subrequirements to the effect of: Direct data capture shall be according to specific user prompts and not as part of a regular schedule.	Added a requirement F-100D6 indicating that CS can be initiated on demand. Subsequently had to add an allocation of F-100 to the CAUI, and a child F-100C1 to provide a user interface for demanding the update.	Y
137.	Mitretek – LG, ArS	33	4.3	F-2141	Page 33, F-2141	Should “F-2141” be “F-214D1”? It does not match the format of a high-level requirement (A-NNN) or detailed requirement (A-NNNUU).	Yes; done.	Y
138.	Stern, A.	33	4.3	F-214D2	Section 4.3, Req F-214D2	What “atmospheric images” will atmospheric data be derived from?	For example, visibility data might be derived from atmospheric images as suggested in the MIT Lincoln Laboratory project sponsored by the <i>Clarus</i> Initiative.	N
139.	Stern, A.	33	4.3	F-218	Section 4.3, Req F-218	Not needed if NOAA convergence occurs.	Requirement deleted per task force review.	Y
140.	Mitretek - ArS	33	4.3	F-218 F-219 F-219J1	Page 33, F-218; Page 53, F-219 & F-219J1	These requirements are to acquire and disseminate NWS watches, warnings, and advisories. What are the other requirement for these items, including storage, logging, retention, quality checking, and performance requirements (e.g., quantity of the data, amount stored, how long retained, throughput, response time)?	Requirements deleted per task force review.	Y
141.	PBS&J	33	4.3	F-218D1	F-218D1, page 33	Define “CAP”	Requirement deleted per task force review.	Y
142.	Mitretek - LG	33	4.3	F-218D1	Page 33, F-218D1	Include the “CAP” and “XML” acronyms in Appendix A.	Requirement deleted per task force review.	Y

Item	Review	Page	Section	Requirement	Section/ Paragraph/ Requirement	Comment	Response	Modified Y/N
143.	Mitretek - LG	33	4.3	F-221 F-221D1	Page 33, F-221 and F-221D1	How is the modified requirement (“retrieve environmental data directly from environmental sensor station collectors”) different from F-201 (“access in-situ environmental observations from data collectors”) on page 31? What is the difference between F-221D1 and F-201D1 on page 32?	Not all in situ observations are from “environmental sensor stations” as it is understood from NTCIP 1204.	N
144.	Mitretek - ArS	33	4.3	F-221 F-221D1	Page 33, F-221 & F-221D1	Are “environmental sensor station collectors” in F-221 synonymous with “sensor station collectors” in F-221D1? If so, use the same terminology in both requirements.	The text of F-221D1 is changed to include the word “environmental” in front of “sensor stations”.	Y
145.	Pol, J.	33	4.3	F-222D1	F-222D1	Should add additional detail like, “The delay period shall not exceed 120 minutes”	The <i>Clarus</i> system has no means of controlling delays outside its own functions.	N
146.	Stern, A.	34	4.3	F-231	Section 4.3, Req F-231	Do “pavement-related” observations also include pavement or subgrade temperatures?	To the extent that they are included in NTCIP 1204, yes.	N
147.	Mitretek - ArS	34	4.3	F-241D1	Page 34, F-241D1	This requirement is two requirements. Split it into two separate requirements. (This will facilitate testing.)	Done.	Y
148.	Task Force	35	4.3	F-281		Change the priority to “H”.	Done.	Y
149.	Task Force	35	4.3	F-281D1		Add a comment: “For example, ASOS/AWOS”.	Done.	Y
150.	Mitretek - LG	36	4.3	F-905D1	Page 36, F-905D1	What is meant by “invalid” data set? Is this a set of data with submission errors (See F-200 on page 31)? What about out of range data?	A comment is added to clarify that an “invalid” data set is one that cannot be understood as received.	Y
151.	Welsh, P.	36	4.3	F-905D1	F-905D1	Add “including the data string as received.”	To be determined in the design activities.	N

Item	Review	Page	Section	Requirement	Section/ Paragraph/ Requirement	Comment	Response	Modified Y/N
152.	PBS&J	36	4.3	H-011	H-011, page 36	Format comment for consistency	Done	Y
153.	Mitretek - LG	36	4.3	H-011	Pages 36, 50 & 55; H-011	On pages 50 and 55, this requirement ends with “data collection”. On page 36, requirement H-011 does not include “data collection” and the comment notes that it was removed.	“Data collection” is removed in all there occurrences.	Y
154.	Mitretek - LG	36	4.3	H-020	Pages 36, 55 & 66; H-020 comment	Note that this is a new high-level requirement that rolls-up H-021, H-022 and H-023 which were deprecated.	Text is added to the comment to reflect this: “Roll up of H-021, H-022, and H-023, which were deprecated”. The children H-020D1, H-020D2, and H-020D3 are removed.	Y
155.	Mitretek - LG	37	4.3	H-151	Page 37, H-151 comment	Replace “F-135 was a duplicate” with “requirement H-151 makes F-135 unnecessary”, “H-151 covers this” or similar statement. The requirements were not duplicates, but were inconsistent.	“F-135 was a duplicate” is deleted.	Y
156.	Task Force	37	4.3	H-151, H-151D1		“Timeframe” should be replaced with “timestamp”.	Done.	Y
157.	Task Force	37	4.3	H-155, H-155D1		“Known” should be replaced with “identified”.	Done.	Y
158.	Stern, A.	38	4.3	I-012	Section 4.3, Req I-012	Is this inferring that there will be direct access to ESS?	No. The requirement is clarified by adding “through its collector” between “stations” and “using”.	Y
159.	Stern, A.	38	4.3	I-014	Section 4.3, Req I-014	This also implies that there will be direct access to ESS	The requirement has been deprecated, and is included here only for completeness of the record.	N
160.	Task Force	38	4.3	I-015, I-015D1		Delete requirements related to manual data entry.	Done.	Y
161.	Mitretek - LG	39	4.3	I-016D2 I-016D3	Page 39, I-016D2, I-016D3	Should “contributor(s)” be “collector(s)” since the Collector Services interface with Collector systems owned by Contributors?	Yes; also in I-017D4.	Y

Item	Review	Page	Section	Requirement	Section/ Paragraph/ Requirement	Comment	Response	Modified Y/N
162.	Mitretek - LG	39	4.3	I-017	Pages 39, 43& 56; I-017 comment	Should the sentence “detailed requirements will reflect the results of that research” be deleted or updated to indicate which detailed requirements were added as a result of research findings?	The sentence beginning with “Other...” is deleted in all occurrences.	Y
163.	Pol, J.	39	4.3	I-017D1	I-017D1	Maybe a subrequirement here should be that the XML specification shall include ITE XML TMDD schema; SAE J2354 (2004), etc.	The inclusion of the TMDD and J2354 specifications are included elsewhere in the requirements.	N
164.	Stern, A.	40	4.3	I-017D6	Section 4.3, Req I-017D6	Are there any DOTs that transfer data using netCDF???	Unknown. The requirement is included to facilitate capture of observations from weather service providers, not necessarily from DOTs.	N
165.	Pol, J.	40	4.3	I-017D6	I-017D6	Need to add another requirement that <i>Clarus</i> shall be able to extract data from SAE J2735 Message Sets for Dedicated Short Range Communications.	There is no published version of this standard available at this time. The requirement can be added such time as J2735 is published.	N
166.	Welsh, P.	40	4.3	I-017D7	I-017D7	Standard Hydrologic Exchange Format (SHEF)	Per Task Force review, no additional formats are needed at this time.	N
167.	Stern, A.	40	4.3	P-012	Section 4.3, Req P-012	In the comment section, it indicates that user demand will be detailed in the detailed requirements. Is this a legacy statement?	Requirement deleted per task force review.	Y
168.	Mitretek - LG	40	4.3	P-012	Pages 40 & 59, P-012 comment	Should the sentence “if this is the case, the detailed requirements will identify the specific data to be provided and the timeliness criteria” be deleted or updated to indicate which detailed requirements relate to specific data or criteria?	Requirement deleted per task force review.	Y
169.	Welsh, P.	40	4.3	P-012D2	P-012D2	Prioritize regional data handling during emergency situations.	Requirement deleted per task force review.	Y

Item	Review	Page	Section	Requirement	Section/ Paragraph/ Requirement	Comment	Response	Modified Y/N
170.	Welsh, P.	41	4.4	Q-012G2	Q-012G2	and transfer data and functions to secondary back-up systems.	Not within the scope of the Watchdog. This is a system administration function, not an internal <i>Clarus</i> system function.	N
171.	Bonds, J.	41	4.4	F-213	F-213	Why is this a requirement allocated to DOG? A DOG requirement should be derived from a reliability or availability requirement.	In this case, the Watchdog has to know that there is an additional component to be monitored, which is the function of the Watchdog.	N
172.	Pol, J.	41	4.4	F-905G1	F-905G1	Modify to read all subcomponent transactions?	The requirement is in place for each component needing to log its activity. The implementation of the logging will be determined in the design activities.	N
173.	Stern, A.	41	4.4	N/A	Section 4.4	Is there a need for a database cleanup function to keep up with the 470 million observations?	Not within the scope of the Watchdog. This is managed as part of the QEDC.	N
174.	Stern, A.	41	4.4	N/A	Section 4.4	Is there a need for anti virus software?	Not within the scope of the Watchdog. This is a system administration function, not an internal <i>Clarus</i> system function.	N
175.	Stern, A.	41	4.4	N/A	Section 4.4	Is there a need for operating system upgrades or patches?	Not within the scope of the Watchdog. This is a system administration function, not an internal <i>Clarus</i> system function.	N
176.	Stern, A.	41	4.4	N/A	Section 4.4	Does there need to be a system backup capability for critical software or data?	Not within the scope of the Watchdog. This is a system administration function, not an internal <i>Clarus</i> system function.	N
177.	Stern, A.	41	4.4	N/A	Section 4.4	Is there a failure recovery mode from a power failure or fatal exception?	No.	N
178.	PBS&J	41	4.4	Q-012G2	Q-012G2, page 41	Clarify – restart unresponsive <i>Clarus</i> services?	Those are the only kind within the scope of the <i>Clarus</i> system; the wording is clarified.	Y

Item	Review	Page	Section	Requirement	Section/ Paragraph/ Requirement	Comment	Response	Modified Y/N
179.	Stern, A.	42			Section 4.5, Req H-120	Should vehicle, remote and derived data be added?	The wording of the requirement has been simplified in all occurrences to remove the ambiguity by removing “that includes...metadata.”	Y
180.	Seeling, L.	42	4.5	H-120	H-120E et al	The various requirements say “maintain contact info” – consider adding a comment that maintaining the contact info is on an as-provided basis only: <i>Clarus</i> doesn’t go out and do anything to get updates.	The word “maintain” was used expressly for this purpose – to indicate that <i>Clarus</i> ’ capability maintains the data it has, not to get new data.	N
181.	Welsh, P.	42	4.5	H-120	H-120	Needs to specifically include graphic metadata such as siting photographs.	Added H-120E9.	Y
182.	Mitretek - ArS	42	4.5	N/A	Pages 42 thru 47, Sections 4.5 and 4.6	The terms “distribute”, “disseminate”, and “provide” are used at various places in the requirements in these sections. Each of these terms should be carefully defined and distinguished from the others. If some of the terms are synonymous, then for consistency use only one of them throughout.	These terms are used in their common English sense. No definitions are required.	N
183.	Pol, J.	43	4.5	H-120E8	H-120E8	Add subrequirement: EM shall be able to maintain contact with VII network switches according to VII communications network design.	Comments are added to H-120B1 and H-120B2 to clarify that the CAS will manage metadata for VII environmental data collection.	Y
184.	Task Force	43	4.5	H-120E9	H-120E9	Add a requirement: “the EMC shall be able to maintain a reference to additional metadata.”	Done.	Y
185.	PBS&J	43	4.5	I-017E1	I-017E1, page 43	No “/” in MSETMCC in definitions	The text is amended to read “TMDD and MS/ETMCC”.	Y
186.	Pol, J.	44	4.6	D-061F1	D-061F1	Should there be verification of the authenticated user to the CAS?	Requirement deleted per task force review.	Y
187.	Welsh, P.	44	4.6	D-061F1	D-061F1	What is an “immediate request”?	Requirement deleted per task force review.	Y

Item	Review	Page	Section	Requirement	Section/ Paragraph/ Requirement	Comment	Response	Modified Y/N
188.	Stern, A.	44	4.6	D-062	Section 4.6, Req D-062	Will the entire metadata record always be transmitted, or is there a filter so that portions of the metadata field are sent?	Based on the requirements, the entire record will be transmitted.	N
189.	Mitretek - LG	44	4.6	D-062 D-062F1	Page 44, D-062, D-062F1	There was no D-062 high-level requirement in the final HRS (released on 7/11/05). Is this a numbering error? Is there a difference between D-061F1 (“response to an immediate request”) and D-062F1 (“response to polling”)?	The requirement was added to specify metadata.	N
190.	Stern, A.	44	4.6	N/A	Section 4.6	What will be the minimum accepted metadata to be accepted by the system? What fields constitute an expanded entry?	To be determined by the <i>Clarus</i> Program during implementation.	N
191.	Mitretek - ArS	44	4.6	N/A	Pages 44 thru 47, Section 4.6 EMS	Some requirements use “metadata” others use “environmental metadata”. Are they synonymous terms or does the former include the latter along with other types of metadata?	Use of the word “metadata” depends completely on the context.	N
192.	Welsh, P.	45	4.6	F-401	F-401	Why subject to data sharing agreements? For example, sensor type should always be available...	Not necessarily. If the contributor elects to limit dissemination of those metadata, <i>Clarus</i> will not disseminate them.	N
193.	Mitretek - LG	45	4.6	F-501F1 P-025F1	Page 45, F-501F1; & Page 47, P-025F1	Is there a difference between F-501F1 (“respond to queries for metadata within one minute”) and P-025F1 (“respond to a request for metadata within one minute”)? Are these duplicate requirements? Or is there a distinction between responding to a request and responding to a query? If there is a distinction, please clarify.	The requirements are duplicates, but both are retained in order to document the links to the parent requirements F-501 and P-025 that are rooted in the ConOps. The text is changed from “one minute” to “five minutes” to be consistent with P-025F1.	Y
194.	Mitretek - ArS	45	4.6	F-501F1	Page 45, F-501F1	Do queries include the polling referred to in previous requirements?	The reference to “previous requirements” is not specific enough to answer the question directly. The queries in this requirement are specific to the EMS.	N

Item	Review	Page	Section	Requirement	Section/ Paragraph/ Requirement	Comment	Response	Modified Y/N
195.	Stern, A.	45	4.6	H-120	Section 4.6, Req H-120	Should vehicle, remote and derived data be added?	The wording of the requirement has been simplified in all occurrences to remove the ambiguity by removing "that includes...metadata."	Y
196.	Welsh, P.	46	4.6	H-120F1	H-120F()	Queries by sensor type. I-023F1	Based on Task Force review, requirement is not added.	N
197.	Task Force	46	4.6	H-120F4		Add a requirement to allow queries by latitude/longitude and radius.	"The EMS shall accept queries based on latitude/longitude location and radius."	Y
198.	Seeling, L.	47	4.6	I-023F1	I-023F1	Can we expand/add to this requirement to let the requestor [know] that the meta data requested is not available or not allowed as opposed to just coming back as a null set?	An I-023F2 requirement is added: "EMS shall respond to queries returning no results with a message stating that no results matching that query are available."	Y
199.	Mitretek - LG	47	4.6	P-025	Pages 47 & 60, P-025 comment	The comment space on page 47 is blank. On page 60, the comment reads "related to F-501".	The comment is added.	Y
200.	Task Force	47	4.6	P-025, P-025F1		Change the requirements from "one minute" to "five minutes".	Done.	Y
201.	Stern, A.	48	4.7	F-215	Section 4.7, Req F-215	What constitute a weather hazard report? Is this a closed set? Are locations represented by lat/lon, map grids, street names, and mileposts? Is the time frame in local time or UTC?	Requirement deleted per task force review.	Y
202.	Welsh, P.	48	4.7	F-215	F-215	Including narrative location.	Requirement deleted per task force review.	Y
203.	Welsh, P.	48	4.7	H-151	H-151	Or manually entered data with timestamp only. (I-015)	Requirement deleted per task force review.	Y
204.	Pol, J.	48	4.7	I-015L3	I-015L3	Should there be a MEUI log to DOG?	Requirement deleted per task force review.	Y
205.	Stern, A.	48	4.7	N/A	Section 4.7	Will some sort of username/password handshake be required to enter manual data?	Requirement deleted per task force review.	Y

Item	Review	Page	Section	Requirement	Section/ Paragraph/ Requirement	Comment	Response	Modified Y/N
206.	Pol, J.	49	4.8	F-111I1	F-111I1	Add subrequirement: Time constraint for life of observation shall be XX.	This requirement is covered in F-521I1	N
207.	Stern, A.	49	4.8	F-521	Section 4.8, Req F-521	Will the <i>Clarus</i> system also maintain a dynamic library of metadata for 7 days?	The metadata will be retained for as long as it is needed to continue the collection of observations.	N
208.	Stern, A.	49	4.8	F-521I1	Section 4.8, Req F-521I1	Will Quality Flags be time purged, version purged, etc after 7 days?	All observation data will be purged after seven days.	N
209.	Mitretek - LG	49	4.8	N/A	Page 49, Section 4.8 title	Based upon the requirements in this section, the title should be “Qualified Environmental Data (QED) Cache” rather than “Qualified Environmental Data (QED)”.	The title and acronym for the component will be changed in all places.	Y
210.	Task Force	50	4.8	H-011		Delete the words “for data collection” in all occurrences of this requirement.	Done.	Y
211.	Seeling, L.	50	4.8	H-011I1	H-011I1	“ <i>The QED observation types shall be defined by NTCIP ESS 1204.</i> ”- would like to recommend adding “ <i>at a minimum</i> ” to allow for other observation types beyond the proof of concept test.	Insofar as <i>Clarus</i> is a surface transportation observations system, the only observations to be defined are described by NTCIP 1204. No change required.	N
212.	Pol, J.	50	4.8	I-022I1	I-022I1	Should there be a QED log to DOG?	The logging functions will be detailed in the design process.	N
213.	Stern, A.	50	4.8	P-013	Section 4.8, Req P-013	If <i>Clarus</i> preprocesses the 470 million observations to create a smaller number of data points, would it make the database more manageable? How large would a database be if 470M observations were kept for 7 days (plus metadata)? What is the frequency of observations?	Preprocessing would reduce the volume of data. The exact system dimensions are an outcome of the design process and will be a subject of the critical design review.	N
214.	Task Force	51	4.9			Modify the introductory paragraph to indicate that all dissemination of data will be subject to the data sharing agreements.	Done.	Y

Item	Review	Page	Section	Requirement	Section/ Paragraph/ Requirement	Comment	Response	Modified Y/N
215.	Task Force	51	4.9	D-061		Insert “environmental” between “disseminate and “data”; delete the allocation to EMS.	Done.	Y
216.	Pol, J.	51	4.9	D-061J1	D-061J1	Should there be verification of user to the CAS?	All data dissemination will be subject to data sharing agreements. It will therefore be necessary in the design to authenticate (verify) the user before fulfilling the request for data. The system design will elaborate the component(s) performing that authentication.	N
217.	Welsh, P.	51	4.9	D-061J1	D-061J1	What is “immediate” env data request?	One not based on a subscription.	N
218.	Stern, A.	51	4.9	D-081	Section 4.9, Req D-081	Will there be a subscription notification service if a parameter exceeds a threshold?	Added a requirement D-081J2 indicating that contributors shall be able to add a threshold filter to notifications.	Y
219.	Task Force	52	4.9	F-100J2		Insert new requirement: “QEDS shall be able to disseminate environmental data in English units.”	Done.	Y
220.	Mitretek - LG	52	4.9	F-101J1 F-115J1 F-140J1	Page 52, F-101J1; Page 53, F-115J1, F-140J1	These QEDS requirements relate to quality control. However, quality control functions are executed by Quality Checking Services (QCS) not Qualified Environmental Data Services (QEDS). Are these requirements of QEDS or QCS?	F-101 and F-101J1 are deprecated from the QEDS requirements. F-115J1 is retained, since it addresses how subscriptions and notifications might be filled by QEDS. Likewise, data managers would use the QEDS to access the quality checking results, so F-140J1 is applicable.	Y
221.	Welsh, P.	52	4.9	F-100	F-100	Refers to Table 1, which does not include Hydro data.	Some hydrological data (e.g., “water depth, road and stream”) are included in Table 1 and in the referenced NTCIP 1204 specification.	N

Item	Review	Page	Section	Requirement	Section/ Paragraph/ Requirement	Comment	Response	Modified Y/N
222.	Task Force	52	4.9	F115		Replace “collectors” in this requirement (and the associated comment) with “contributors”.	Done.	Y
223.	Mitretek - LG	53	4.9	F-115J1	Page 53, F-115J1	Does “sensor efficacy QC service quality flags” refer to the Sensor Range Test on page 90? If so, use consistent terminology to avoid confusion.	The phrase “sensor efficacy QC service quality flags” is replaced with “observation quality flags” to clarify the requirement.	Y
224.	Stern, A.	53	4.9	F-115J1	Section 4.9, Req F-115J1	What is the definition of a “sensor efficacy QC service quality flag”?	The phrase “sensor efficacy QC service quality flags” is replaced with “observation quality flags” to clarify the requirement.	Y
225.	Task Force	53	4.9	F-115J2		Add a new requirement: “QEDS shall provide quality checking statistics to data contributors.” Add a comment for this requirement: “Functionality may be similar to that provided by MADIS and MesoWest.”	Done.	Y
226.	Stern, A.	53	4.9	F-140	Section 4.9, Req F-140	Will only quality managers be able to see qc check flags? What about other end users?	Quality flags can be published with the observations to any user, subject to data sharing agreements.	N
227.	Task Force	53	4.9	F-140		Add the definition of “quality manager” to the Appendix A glossary.	Done	Y
228.	Task Force	53	4.9	F-140, F-140J1		Replace “view” with “review”.	Done.	Y
229.	Stern, A.	53	4.9	F-213J1	Section 4.9, Req F213J1	Is there a notification service to alert users when a new observation becomes available?	This requirement concerns new observation <i>types</i> , not new observations. Requirement D-081 addresses notifications for particular new observations.	N
230.	Pol, J.	54	4.9	F-805J1	F-805J1	Subrequirement? QEDS shall enable filtered data to pass through as per data sharing agreements.	F-805 and F-805J1 are deprecated per Task Force discussions.	Y

Item	Review	Page	Section	Requirement	Section/ Paragraph/ Requirement	Comment	Response	Modified Y/N
231.	Stern, A.	54	4.9	F-811J1	Section 4.9, Req F-811J1	How will it determine if an observation should be disseminated? Based on data quality rules?	No... based on data sharing and user agreements.	N
232.	Task Force	66	4.10	H-020J1, H-020J2, H-020J3		Deprecate these requirements and move the list of what constitutes "environmental data" in H-020 to the definitions in Appendix A.	Done.	Y
233.	Mitretek - LG	56	4.8	I-017J2	Page 56, I-017J2	Add the "HDF" acronym to Appendix A. This format was not included in requirements for Collector Services? Should such a requirement be included on page 40?	Done. The format was not included in the CS requirements since no potential sources of observations using HDF have yet been identified.	Y
234.	PBS&J	56	4.9	I-017J2	I-017J2, page 56	Define "HDF"	HDF is the Hierarchical Data Format from the National Center for Supercomputing Applications (NCSA). The term is added to the Appendix A glossary.	Y
235.	Pol, J.	57	4.9	I-017J4	I-017J4	Tentative, possible new requirement: QEDS shall be able to disseminate environmental data in SAE J2735 format.	A requirement for SAE J2735 compliance can be added when the standard becomes available for review.	N
236.	Seeling, L.	57	4.9	I-022J1	I-022J1	Need to receive something back, even headers with no data or "query found no data" to minimize user interface frustration on whether I got the right answer or not.	A new requirement I-022J2 is added to address this issue: "QEDS shall respond to queries returning no results with a message stating that no results matching that query are available."	Y
237.	Stern, A.	58	4.9	I-026J1	Section 4.9, Req I-026J1	Lat/lon pairs can be hard to work with. How about using a lat/lon and radius?	Done. A new requirement I-026J2 is added: "QEDS shall accept location queries based on a latitude/longitude location and radius."	Y
238.	Pol, J.	58	4.9	I-026J1	I-026J1	QEDS to accept location queries based on a polygon defined by lat/long points?	Location queries will be based on a bounding box of two lat/log points, or on a single lat/long point and a radius.	N

Item	Review	Page	Section	Requirement	Section/ Paragraph/ Requirement	Comment	Response	Modified Y/N
239.	Pol, J.	59	4.9	I-033J2	I-033J2	QEDS shall verify/validate subscription requests from the CAS.	If necessary. The design may allow subscriptions to be managed completely within the QEDS.	N
240.	Pol, J.	59	4.9	I-033J8	I-033J8	Subscription terminations are passed along to the CAS.	If necessary. The design may allow subscriptions to be managed completely within the QEDS.	N
241.	Task Force	60	4.9	P-012, P-012J1		Deprecate the requirements.	Done.	Y
242.	Welsh, P.	60	4.9	P-024	P-024	(20 minutes seems long data in 20 metadata in 1?) Was this meant to be data received within 20 minutes will be disseminated to providers based on subscriptions.	Consistent with the ConOps, twenty minutes is the required maximum time in which environmental data has to be available for dissemination	N
243.	Stern, A.	60	4.9	P-031	Section 4.9, Req P-031	This requirement provides for 300 simultaneous requests. Doesn't P-041 have 600?	As noted in the comment, it is assumed that half of concurrent users would be requesting data.	N
244.	Task Force	60	4.9	P-031		The word "element" should be removed from the requirement.	Done.	Y
245.	Task Force	61	4.10	F-100H1		"Quality control" should be changed to "quality check".	Done.	Y
246.	Stern, A.	61	4.10	F-111H2	Section 4.10, Req F-111H2	What are the numeric confidence values based upon? Is it customizable?	The confidence value would be used in those tests for which algorithms are able to provide some relative measure of consistency or confidence in the measurement relative to other measurements (for example, in a spatial or temporal check). It is customizable to the extent that the value to be recorded depends completely on the QChS algorithm. The text of the requirement is clarified by replacing "shall" with "shall be able to".	Y

Item	Review	Page	Section	Requirement	Section/ Paragraph/ Requirement	Comment	Response	Modified Y/N
247.	Mitretek - LG	61	4.10	N/A	Pages 61 thru 67, Section 4.10, QCS; Pages 90 thru 96, Appendix B, QC Tests	Should Appendix B (and/or each QC test therein) be referenced in Section 4.10.	The examples described in the Appendix are named in the comment field of the relevant requirements.	Y
248.	Task Force	62	4.10	F-115		The word “collectors” should be changed to “contributors”; likewise in the comment.	Done.	Y
249.	Welsh, P.	62	4.10	F-115H1	F-115H1	Does this refer to sensor type station or what? Escalation problem.	The requirement has been reworded to better capture the intent: “A QChS shall evaluate data quality conditions.”	Y
250.	Task Force	62	4.10	F-121		Please provide examples in the comment field.	“For example – sensor range tests and climate tests.”	Y
251.	Stern, A.	62	4.10	F-121H2	Section 4.10, Req F-121H2	Who will provide climate records? Will this be maintained as part of the metadata? What happens if there aren’t climate records for this site?	The requirements do not specify where the climatological data would be obtained, but they are likely to come from NOAA. Climate records will be recorded in the metadata cache for QChS purposes. If climatological records for the specific site are not available, nearby or regional data could be used, or the test could be skipped.	N
252.	Task Force	62	4.10	F-121H3		Insert a new requirement to specify that the system must be able to use monthly climate extremes for range checking.	“QChS algorithms shall be able to use monthly climate extremes for range checking bounds.”	Y
253.	Welsh, P.	62	4.10	F-141	F-141	Why the change? F141H1 page 62	The “new” wording of the requirement preserves the original automated result while allowing an independent human quality check. “Example – manual quality check” is appended to the comment for the requirement.	Y
254.	Welsh, P.	62	4.10	F-141H1	F-141H1	Should be cross-referenced to deleted comment earlier.	It is unclear which earlier deleted comment is being referred to.	N

Item	Review	Page	Section	Requirement	Section/ Paragraph/ Requirement	Comment	Response	Modified Y/N
255.	Mitretek - LG	63	4.10	F-151H1	Page 63, F-151H1	The requirement is “QCS shall indicate when a quality check has been performed”. What is meant by “indicate”? Does the QCS simply record the information for retrieval by another module? Does the QCS transmit the information to another module each time a check is performed? Please clarify.	The requirement leaves the implementation of an indication to the designer. In practice, the QChS can only record that the check has been performed; other components (the QEDS, specifically) would convey that information to <i>Clarus</i> user systems.	N
256.	Mitretek - LG	63	4.10	F-155	Page 63, F-155 allocation	Replace “QCS, CAS” with “QCS, CAS, CAUI”.	Done.	Y
257.	Task Force	63	4.10	F-155		Please provide examples in the comment field.	“For example – variable-specific tests.”	Y
258.	Task Force	63	4.10	F-162		Insert “using available data” after “spatial tests” in the text of the requirement. The comment should indicate that “Available data could be from adjacent environmental sensor stations and ASOS. Examples – Barnes spatial test and optimal interpolation spatial test.”	Done.	Y
259.	Task Force	63	4.10	F-162H1		Insert “using available data” after “spatial tests” in the text of the requirement. The comment should indicate that “Available data could be from adjacent environmental sensor stations and ASOS.”	Done.	Y
260.	Seeling, L.	63	4.10	F-163	F163	So, the comment says regional differences but the requirement says rules specific to observation locations. This requirement seems like a large loophole in that you could have different rule for each location and each parameter.	Correct. The intent is to allow regional (climatological) differences to be accommodated in the QChS. This is not, <i>per se</i> , a loophole; the intent is to provide necessary flexibility in configuring and implementing the QChS, not to circumvent the quality checking functions of <i>Clarus</i> .	N

Item	Review	Page	Section	Requirement	Section/ Paragraph/ Requirement	Comment	Response	Modified Y/N
261.	Mitretek - ArS	64	4.10	F-163H1	Page 64, F-163H1	These are the only requirements for “quality checking rules”. Are these distinct from “quality control rules” called out in other requirements? Also there are no requirements to configure or define quality checking rules as there are for quality control rules. Be consistent.	“Quality control” is changed everywhere in the document to “quality checking” to remove the inconsistency.	N
262.	Stern, A.	64	4.10	F-165	Section 4.10, Req F-165	Requires access to “multiple observations”. Could this be access to supplemental datasets like NOAA METARS?	If METARS observations are used, they will likely be incorporated into spatial tests. This requirement refers to tests based on comparisons to multiple observations from the same location and time – for example, variable-specific and like instrument tests.	N
263.	Task Force	64	4.10	F-165		Please provide examples in the comment field.	“For example – variable-specific tests and like instrument tests.”	Y
264.	Welsh, P.	64	4.10	F-166	F-166	Outstanding!	Thank you.	N
265.	Task Force	64	4.10	F-166		Please provide examples in the comment field.	“For example – step tests and persistence tests.”	Y
266.	Stern, A.	64	4.10	F-171	Section 4.10, Req F-171	Provide details on how a historical record will be obtained and used.	The historical record refers in this context primarily to climatological records. These records would be obtained from the relevant NOAA (or other agency) climatological records and retained in the EMC for QChS purposes.	N
267.	Seeling, L.	64	4.10	F-171	F-171	If you aren’t archiving past 7 days, how do you get historical environmental data to base the QC process on?	Data not available from the QEDC will have to be retained by the EMC.	N

Item	Review	Page	Section	Requirement	Section/ Paragraph/ Requirement	Comment	Response	Modified Y/N
268.	Mitretek - LG	65	4.10	F-207	Page 65, F-207 comment	The comment notes that the requirement was deprecated because derived values do not need to be stored. However, the requirement relates to calculation of values, not storage. As shown in Figure 3, the system will function as noted in the requirement (i.e., “calculate derived environmental data from observations”). Should the requirement be deprecated?	Requirement deleted per task force review.	Y
269.	Task Force	65	4.10	F-241		Deprecate the requirement; it is covered by F-201.	Done.	Y
270.	Stern, A.	66	4.10	F-241H1	Section 4.10, Req F-241H1	How can QC of mobile data be treated the same as in-situ data? Mobile data may need many more QC processes	Requirement deleted per task force review.	Y
271.	Task Force	66	4.10	H-020H1, H-020H2, H-020H3		Deprecate these requirements and move the list of what constitutes “environmental data” in H-020 to the definitions in Appendix A.	Done.	Y
272.	Task Force	66	4.10	H-301		Provide a comment describing what is meant by “across North America”.	The comment field will include the following: “North America in this context includes the United States, its territories, Canada, and Mexico.”	Y
273.	Welsh, P.	67	4.10	P-023H1	P-023H1	Need clarification. Recommend 023 add initial QCS processes.	Per Task Force direction, the text of the requirement is changed from “QCS...” to “A QChS...” and from “its processing” to “an automated quality check”.	Y
274.	Welsh, P.	67	4.10	P-024H1	P-024H1	Need clarification. Indicate final QCS processing.	Per Task Force direction, the text of the requirement is changed from “QCS...” to “A QChS...” and from “its processing” to “an automated quality check”.	Y

Item	Review	Page	Section	Requirement	Section/ Paragraph/ Requirement	Comment	Response	Modified Y/N
275.	Stern, A.	68	4.11	F-101	Section 4.11, Req F-101	“Continuous” quality control processes?	The requirement was taken directly from the ConOps, and is applied to the Schedule Service in the child F-101K1 requirement. The language of the requirement is clarified, however, by removing the word “continuous” and inserting “as soon as data become available” after “processes”.	Y
276.	Task Force	68	4.11	I-016K1		Replace “scheduled events” with “event schedules”.	Done.	Y
277.	Task Force	69	4.12			“Participating organizations” should be replaced in all places in the Program Requirements with “contributors”.	Done.	Y
278.	Task Force	69	4.12			“Agreement” should be replaced in all places in the Program Requirements with “Clarus Data Sharing Agreement”.	Done.	Y
279.	Welsh, P.	69	4.12	D-011A1	D-011A1	Track constituent hosts and monitor.	The monitoring requirement is covered under the Watchdog requirements Q-012G1 and Q-012G2. No change.	N
280.	Seeling, L.	69	4.12	D-021 D-031	D-021 & D-031	Which industry’s “industry accepted standard interfaces”?	These are admittedly not hard (i.e., objectively testable) requirements, but they may be helpful to designers that might otherwise want to build a system that would not be portable or extensible. No change.	N
281.	PBS&J	69	4.12	X Reqs.	X Requirements	Add “Clarus” before “Agreement”	The text of the requirements has been changed in all locations from “Agreement” to “Clarus data sharing agreement”.	Y
282.	Stern, A.	70	4.12	D-121	Section 4.12, Req D-121	GPS coordinates should be more precise than 50 feet – especially for VII data.	The requirement is a minimum specification (constraint) on the data, but will be changed to 3 feet to accommodate VII.	Y

Item	Review	Page	Section	Requirement	Section/ Paragraph/ Requirement	Comment	Response	Modified Y/N
283.	PBS&J	70	4.12	D-101	D-101, page 70	Provide URL for “FHWA requirements for web sites”	The URL (http://www.tfsrc.gov/qkref/qrg08.htm) has been added to the comment field.	Y
284.	Seeling, L.	70	4.12	D-121	D-121	“The <i>Clarus</i> system shall be able to specify location to the nearest fifty feet” seems like a performance requirement	The requirement constrains the design of the data store and supporting components, but not the performance of the system itself.	N
285.	Welsh, P.	70	4.12	D-121	D-121	There is a national location standard that specified locatability to 30 feet.	The requirement will be revised to remove the parenthetical “(standard GPS)”, which implied a particular standard.	Y
286.	Task Force	71	4.12	X-20111		Replace “system” with “program” and “Agreements” with “ <i>Clarus</i> data sharing agreements”.	Done	Y
287.	Task Force	71	4.12	X-20112		Replace “participating organizations” with “contributors”. Change “Agreement” in the comment to “ <i>Clarus</i> data sharing agreement”.	Done	Y
288.	Task Force	71	4.12	X-20113		Replace “participating organizations” with “contributors” and “Agreement” with “ <i>Clarus</i> data sharing agreement”.	Done	Y
289.	Stern, A.	71	4.12	X-20114	Section 4.12, Req X-20114	Why should organizations identify the intended use of <i>Clarus</i> data?	Per the Task Force Review, the requirement is reworded such that “participating organizations” is replaced with “contributors” and “the shared...” becomes “their shared...” The comment is also deleted.	Y
290.	Task Force	72	4.12	X-20110		Add a new requirement reading “The <i>Clarus</i> program shall identify categories of recipients for dissemination of data.”	Done	Y

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291.	Stern, A.	72	4.12	X-20115	Section 4.12, Req X-20115	Why include this?	The requirement was reworded in the Task Force review to read “The contributors shall identify the categories of recipients of their shared data and information.”	Y
292.	Task Force	72	4.12	X-20116		Replace “participating organizations” with “contributors” and “the shared...” with “their shared...”	Done	Y
293.	Welsh, P.	72	4.12	X-20117	X-20117	Where is liability exemption from (i.e. statute)?	Requirement deleted per task force review.	Y
294.	Stern, A.	72	4.12	X-20118	Section 4.12, Req X-20118	If we have an “open” portal, then there may need to be a set of dissemination rules for “everyone else”.	Dissemination rules have been incorporated into other requirements, and this requirement was modified by the Task Force .	N
295.	Task Force	74	4.12	X-20118		Replace “participating organizations” with “contributors” and “system” with “program”. Delete comment.	Done.	Y
296.	Task Force	74	4.12	X-20119		Replace “participating organizations” with “contributors” and “system” with “program”.	Done.	Y
297.	Task Force	74	4.12	X-20121		Replace “participating organizations” with “contributors” and “system” with “program”.	Done.	Y
298.	Task Force	73	4.12	X-2012		Per Task Force review, correct requirement number to X-20120, replace “participating organizations” with “contributors”, and replace “system” with “program”.	Done.	Y
299.	Stern, A.	73	4.12	X-20123	Section 4.12, Req X-20123	Why include this as a requirement?	Requirement was modified by the Task Force Review to replace “participating organizations” with “Clarus Initiative Management Team” and “system” with “program”.	Y

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300.	Stern, A.	73	4.12	X-20124	Section 4.12, Req X-20124	Why include this as a requirement?	Requirement was modified by the Task Force Review to replace “participating organizations” with “Clarus Initiative Management Team” and “system” with “program”.	Y
301.	Task Force	74	4.12	X-20125		Deprecate this requirement.	Requirement deleted per task force review.	Y
302.	Task Force	74	4.12	X-20126		Revise requirement to read “The contributors shall inform the <i>Clarus</i> program of ...”	Done.	Y
303.	Task Force	74	4.12	X-20127		Revise requirement to read “The <i>Clarus</i> program shall determine its redistribution of shared data from contributors based upon <i>Clarus</i> data sharing agreements.”	Done.	Y
304.	Task Force	74	4.12	X-20128		Revise requirement to read “The <i>Clarus</i> program shall report successes and failures in data and information transmission to its contributors.”	Done.	Y
305.	Task Force	74	4.12	X-20129		Revise requirement to read “The contributors shall report periods of data and information outages to the <i>Clarus</i> program.”	Done.	Y
306.	Task Force	74	4.12	X-20131		Revise requirement to read “The <i>Clarus</i> program shall maintain information about requestors and their access to data and information.”	Done.	Y
307.	Task Force	75	4.12	X-20132		Replace “participating organizations shall provide a representative to” with “ <i>Clarus</i> Initiative Management Team”.	Done.	Y

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308.	Mitretek - LG	75	4.12	X-20133 X-20144 X-20145 X-20148 X-20149 X-20151	Page 75, X-20133; Page 77, X-20144 (first instance of the phrase); Page 78, X-20145; Page 79, X-20148, X-20149, X-20151	Should “Clarus system” be “Clarus Initiative Managers”, “Clarus system designers”, “Clarus system operators”?	“System” in X-20133 was changed to “Initiative Management Team”. X-20144, X-20145, X-20148, and X-20151 were deleted per task force instructions. “System” in X-20149 was changed to “program”.	Y
309.	Task Force	75	4.12	X-20134		Replace “participating organizations” with “Clarus Initiative Coordinating Committee”.	Done.	Y
310.	Task Force	75	4.12	X-20135		Replace the existing requirement X-20135 with a requirement like X-20136 replacing “contributors” with “requestors” and “data sharing agreement” with “user agreement”.	Done.	Y
311.	Task Force	75	4.12	X-20136		Replace “participating organizations” with “contributors” and “governing authorities of the signatories of” with “Clarus data sharing”.	Done.	Y
312.	Stern, A.	76	4.12	X-20137	Section 4.12, Req X-20137	The wording needs to be corrected “...in any commercial use to shared data...” What does this mean?	Requirement deleted per task force review.	Y
313.	Seeling, L.	76	4.12	X-20137	X-20137	Requirement is too long – recommend deleting	Requirement deleted per task force review.	Y
314.	PBS&J	76	4.12	X-20137	X-20137, page 76	Change “use to” to “use of”	Requirement deleted per task force review.	Y
315.	Pol, J.	76	4.12	X-20137	X-20137	We should have some discussion about this to make sure we understand what we’re saying here.	Requirement deleted per task force review.	Y
316.	Welsh, P.	76	4.12	X-20137	X-20137	How does this mesh with use in automated analysis and modeling?	Requirement deleted per task force review.	Y

Item	Review	Page	Section	Requirement	Section/ Paragraph/ Requirement	Comment	Response	Modified Y/N
317.	Task Force	76	4.12	X-20138		Delete requirement.	Requirement deleted per task force review.	Y
318.	Task Force	76	4.12	X-20139		Replace “participating organizations” with “contributors” and “agreement” with “Clarus data sharing agreement”.	Done.	Y
319.	Task Force	76	4.12			Add a requirement X-20140 like X-20139 replacing “contributors” with “requestors” and “data sharing agreement” with “user agreement.	Done.	Y
320.	Task Force	76	4.12	X-20141		Replace “system” with “program” and “participating organizations” with “contributors”.	Done.	Y
321.	Task Force	76	4.12	X-20142		Replace “system” with “program” and “participating organizations” with “contributors” in both places.	Done.	Y
322.	Task Force	80-82	4.12	X-20143 through X-20148		Deprecate these requirements.	Requirement deleted per task force review.	Y
323.	Welsh, P.	77	4.12	X-20143	X-20143	Where is liability exemption from (i.e. statute)?	Requirement deleted per task force review.	Y
324.	Welsh, P.	78	4.12	X-20146	X-20146	Where is liability exemption from (i.e. statute)?	Requirement deleted per task force review.	Y
325.	Welsh, P.	78	4.12	X-20147	X-20147	Where is liability exemption from (i.e. statute)?	Requirement deleted per task force review.	Y
326.	Task Force	79	4.12	X-20149		Change “system” to “program” and “time certain” to “timely”.	Done.	Y
327.	Task Force	79	4.12	X-20151		Deprecate this requirement.	Requirement deleted per task force review.	Y
328.	Seeling, L.	79	4.12	X-20152 X-20154	X-20152 & X-20154	Recommend deletion	X-20152 was modified but not deleted, and X-20154 deleted per task force review.	Y
329.	Welsh, P.	80	4.12	X-20156	X-20156	Notice, YES. Agreement by all parties, NO.	Requirement deleted per task force review.	Y

Item	Review	Page	Section	Requirement	Section/ Paragraph/ Requirement	Comment	Response	Modified Y/N
330.	Task Force	80-82	4.12	X-20153 through X-20164 (exclusive of X-20160)		Deprecate these requirements.	Requirement deleted per task force review.	Y
331.	Stern, A.	83	4.12	X-221	Section 4.12, Req X-221	What is "customer service"? A help page? A person who answers a phone X hours/day? An automated phone system?	The suggested implementations of "customer service" will be considered during system design activities.	N
332.	Task Force	83	4.12	X-231		Deprecate as redundant with the modified X-232.	Requirement deleted per task force review.	Y
333.	Task Force	83	4.12	X-232		Replace "control" with "checking".	Done.	Y
334.	PBS&J	85	4.12	X-615	X-615	Add "U.S." before "DOT"	Done.	Y
335.	Stern, A.	87	4.12	X-101	Section 4.12, Req X-101	Does this extend to the manual entry of data? What constitutes an approved source?	Since manual entry of data has been removed from the requirements per task force review, the first question is no longer relevant. Per the comment, it is expected that "approved sources" will be those with whom data sharing agreements will be established. The text was modified accordingly.	Y
336.	Task Force	87	4.12	X-101	X-101	Change "... approved sources" to "sources with whom data sharing agreements have been established."	Done.	Y
337.	PBS&J	88	App A	N/A	Appendix A, pages 88 & 89	Define "TRB" "COTS" "TMC" "TOC" "ADAS" "RUC"	Done.	Y
338.	Handman, A.	88	App A	N/A	Acronyms Appendix A	Add definition for "COTS"	Done.	Y
339.	Mitretek - LG	88	App A	N/A	Page 88, Appendix A	Should the module acronyms listed in Table 4 (page 22) be included in the appendix?	Done.	Y

Item	Review	Page	Section	Requirement	Section/ Paragraph/ Requirement	Comment	Response	Modified Y/N
340.	Welsh, P.	88	App A	N/A	Appendix A	Add definition of SHEF, Standard Hydrological Encoding Format.	Done.	Y
341.	Welsh, P.	90	App B	N/A	Appendix B	Sensor Range Test – Flag not as “failed” but “out of range”.	Flags will be tied explicitly to the test being performed such that there is no need to modify the label for the state of each particular quality flag.	N
342.	Welsh, P.	90	App B	N/A	Appendix B	Climate Test – Flag not as “failed” but “exceeds climatology”.	Flags will be tied explicitly to the test being performed such that there is no need to modify the label for the state of each particular quality flag.	N
343.	Welsh, P.	90	App B	N/A	Appendix B	Barnes Test – Flag as “failed Barnes” and provide Delta (for example >3 sigma).	Flags will be tied explicitly to the test being performed such that there is no need to modify the label for the state of each particular quality flag.	N
344.	Welsh, P.	90	App B	N/A	Appendix B	Optimal interpolation is a poor test for data...it is designed to smooth data for Model Initialization and uses smoothed equations and previous forecast expected values for the Data test many cases have been documented of OI schemes throwing out real extreme events in the literature. Recommend the Ensemble Kalman Filter (EKF) as a replacement, which has wide applicability across data types from Electrical Engineering to Remote Sensing to Meteorology (see NOAA FSL LAPS as meteorological example) and better handles extreme (but real) values. Many problems with tests, but in each case naming the Flag “Test Name” is preferable to “failed”.	The recommendation will be taken under advisement as part of the design process.	N
345.	PBS&J	93	App B	N/A	Appendix B, paragraph 3, page 93	Change “observations is” to “observations are”	Done.	Y

Item	Review	Page	Section	Requirement	Section/ Paragraph/ Requirement	Comment	Response	Modified Y/N
346.	Task Force	82	4.12			Add a requirement that the <i>Clarus</i> program shall notify contributors and requestors of the limitation of liability for use of the system.	Requirements X-20165 and X-20166 have been added.	Y